Environmental Product Declaration

In accordance with ISO 14025 and EN 15804 for:

Supergrout tixotropico R4

from

CVR S.r.l.

Programme:	**The International EPD® System, www.environdec.com**
Programme operator:	**EPD International AB**
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Programme information

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden www.environdec.com info@environdec.com

Product category rules (PCR): "*Construction Products and Construction Services", 2012:01 ver. 2.3 del 15.11.2018, CPC 374.*
Appointed PCR moderator: *Martin Erlandsson, IVL Swedish Environmental Research Institute, martin.erlandsson@ivl.se*
PCR review was conducted by: Technical Committee of the International EPD® System.
Independent third-party verification of the declaration and data, according to ISO 14025:2006: ☐ EPD process certification ☒ EPD verification
Third party verifier: Certiquality S.r.l. *In case of accredited certification bodies:* Accredited by: *ACCREDIA under accreditation number 003H Rev14.*
Procedure for follow-up of data during EPD validity involves third party verifier: ☒ Yes ☐ No

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Company information

Owner of the EPD:

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Description of the organization: The company has 35 years of experience in research for the development and production of adhesives and special mortars for construction, in particular for restoration and recovery.

It engages in a continuous relationship with designers, companies and applicators and in constant collaboration and consultancy with laboratories and research centers. CVR is strongly committed to the evolution and improvement of products through the acquisition of new technologies and believes in the use of high quality raw materials that achieve qualitative excellence of the entire product range. The company has been committed to energy and environmental sustainability for years.

Product information

Product name: Supergrout tixotropico R4

Product description: It is a highly resistant, fiber-reinforced rheoplastic mortar with compensated thixotropic behavior, specific for centimetric restoration interventions of structural elements in reinforced concrete in which it is necessary to reconstruct missing or damaged parts or to consolidate, by means of section increases, elements such as beams, pillars or fronts of balconies. It is also used for the construction of reinforced plasters or for the execution of high-strength collaborating slabs for the consolidation of structures with poor mechanical resistance.

Geographical scope: Italy

LCA information

Declared unit: 1 kg of Supergrout tixotropico R4 in 25 kg bags.

Time representativeness: All data collected and used in the LCA study refer to the year 2018.

Database(s) and LCA software used: Ecoinvent 2018 version 3.5 (99.9%); ELCD (0.1%).

LCA software used: SimaPro 9.0.

System diagram:

Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
Raw materials	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA

Description of system boundaries: The boundaries of the system follow the from CRADLE to GATE approach, comprising the A1, A2 and A3 Product stage phases.

Upstream processes (A1) include:

- Production of raw materials;
- The production of electricity, methane and the production of heat used to produce the product.

Core processes (A2-A3) include:

- Transport of raw materials, auxiliary materials and packaging up to the plant;
- Production of auxiliary materials and materials used for packaging;
- Preparation of semi-finished products used in the production of the examined product;
- Production of specific mortar, including both all processing phases, plant emissions and outgoing waste;
- Waste treatment leaving the company.

Excluded lifecycle stages: Construction process, use, end-of-life and resource recovery stages were not taken into account due to the large number of possible applications of the selected product.

More information: The processes in the Ecoinvent database were chosen with a Cut-off, U mode. In the study, mass allocation was always applied to attribute the impacts for the production process. In the upstream and core processes (A1-A3) all incoming and outgoing material and energy flows were considered, with the exception of packaging raw materials, which represent an impact of less than 1% of the total.

The only exception was the densified silica fume component, which is a by-product of the silicon and ferrosilicon alloy production process. In this case, an economic allocation rule was selected and applied, based on literature recommendations.

LCA practitioner:

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Content Declaration

Description of the system production: The process of the Supergrout Tixotropic R4 mortar production consists of the step that are listed below:

1. Calcium carbonate grinding;
2. Grinded material Screening;
3. Mixing of main components and additives;
4. Packaging.

Description of the product content: The main components and ancillary materials of Supergrout Tixotropic R4 are the following:

MATERIALS	Percentage (%)
Aggregates and fillers	40-60
Cement	30-40
Additives	5-10

Environmental performance

Potential environmental impact

PARAMETER	UNIT	TOTAL A1-A3
Global warming potential (GWP)	kg CO_2 eq.	1.121
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.	7.298 E-8
Acidification potential (AP)	kg SO_2 eq.	2.624 E-3
Eutrophication potential (EP)	kg PO_4^{3-} eq.	3.564 E-4
Formation potential of tropospheric ozone (POCP)	kg C_2H_4 eq.	1.582 E-4
Abiotic depletion potential – Elements	kg Sb eq.	1.267 E-7
Abiotic depletion potential – Fossil resources	MJ, net calorific value	7.65

Use of resources

PARAMETER		UNIT	TOTAL A1-A3
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value	9.372
	Used as raw materials	MJ, net calorific value	0.000
	TOTAL	MJ, net calorific value	9.372
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value	1.264
	Used as raw materials	MJ, net calorific value	0.000
	TOTAL	MJ, net calorific value	1.264
Secondary material		kg	0.000
Renewable secondary fuels		MJ, net calorific value	0.000
Non-renewable secondary fuels		MJ, net calorific value	0.000
Net use of fresh water		m^3	0.0014

Waste production and output flows

Waste production

PARAMETER	UNIT	TOTAL A1-A3
Hazardous waste disposed	Kg/DU	0.000
Non-hazardous waste disposed	Kg/DU	0.064
Radioactive waste disposed	Kg/DU	0.000
Total	**Kg/DU**	**0.064**

References

- General Programme Instructions of the International EPD® System. Version 3.0.
- PCR 2012:01. Construction Products and Construction Services. Version 2.3
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- Timm JFG, Morales MFD, Passuello A, Sensitivity analysis of life cycle impacts distribution methods choice applied to silica fume production. Sustainable built environment conference 2019.

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